

A STUDY ON THE PATTERN OF FUNGAL INFECTIONS AND CLINICAL PROFILE IN IMMUNOCOMPROMISED PATIENTS WITH SPECIAL REFERENCE TO CHARACTERISATION AND MOLECULAR STUDY OF CANDIDA SPECIES IN A TERTIARY CARE HOSPITAL

ABSTRACT

INTRODUCTION

In immunocompromised patients, there has been a steady increase in the frequency of opportunistic invasive fungal infections (IFIs). Invasive fungal infections caused by candida species and Aspergillus species are major causes of morbidity and mortality. A definite increase in candida non-albicans species associated with a higher mortality has been reported. A high degree of suspicion is necessary for the early diagnosis and treatment of fungal infections.

METHODOLOGY

This cross sectional study was conducted among 100 immunocompromised patients with clinical suspicion of having fungal infections in the institute of Microbiology in association with Department of Hematology, Department of Medical oncology and Institute of Internal medicine, Madras medical college and RGGGH, Chennai-3 for a period of one year from March 2017 to February 2018.

RESULTS

This cross sectional study of one year period included 100 patients with clinical suspicion of Invasive fungal infections between March 2017 to February 2018. There were 60% males and 40% females in the clinically diagnosed cases of invasive fungal infections. The most common age group affected by fungal infection was found to be between 31-40 years .

Among the study population, 41% of the patients showed fungal growth. Proven IFI was found in 15% of the cases and remaining were under the category of probable IFI (85%). Among the 41 fungal isolates, majority of them were *Candida non-albicans* (31.7%) followed by *Candida albicans* (24.4%), *Aspergillus fumigatus* (22%), *Aspergillus flavus* (12.2%), *Aspergillus niger* (5%) and *Rhizopus* (2%).

Among the invasive Candidiasis, majority of them were *Candida non-albicans* (56.5%) followed by *Candida albicans* (43.5%) in clinical samples. In urine samples, among the *Candida* species, majority of them were *Candida tropicalis* (14.3%), *Candida albicans* (14.3%), followed by *Candida parapsilosis* (4%), *Candida glabrata* (2%) and *Candida krusei* (1%). In blood culture, the most common *Candida* species isolated were *Candida glabrata* (18.2%) followed by *Candida albicans* (9%)

Among the patients with Proven and Probable IFI, Candidiasis constitutes 56% followed by Aspergillosis (39%) and Zygomycosis (5%). Antifungal susceptibility testing was performed for *Candida* isolates by Disk diffusion method. Fluconazole resistance was observed among *C. albicans* and *C. tropicalis* with 70% and 42.86% respectively.

Virulence characters such as Phospholipase and hemolysin activity was tested for *Candida* isolates. *C. albicans* and *C. tropicalis* showed high production of Phospholipase activity. Hemolysin production among *Candida* species, higher level of production of β hemolysis was observed in *Candida albicans* (60%) and *Candida non-albicans* (54%). Hemolysin production among *Candida non-albicans* species, higher level of β hemolysis was observed in *C. krusei* (100%).

Fluconazole resistance among the *Candida* species tested by PCR showed the presence of ERG11 gene in 2 isolates of *C.albicans*. The clinical outcome of the patients included in the study was determined. The overall mortality seen in this study was 11% and the cases had Proven IFI and Probable IFI.

CONCLUSION

The etiological agent of IFI was identified in 41% of infected patients. The leading cause of IFI was invasive Candidiasis followed by Aspergillosis. Invasive Candidiasis was mainly caused by *Candida non-albicans* followed by *Candida albicans*. *Aspergillus fumigatus* was the commonest spp causing Aspergillosis in IFI. Higher production of Phospholipase and hemolysin activity was shown in *Candida albicans*. *Canida non- albicans* also showed higher level of Phospholipase and hemolysin activity. Antifungal susceptibility testing for *Candida* spp by Disk diffusion method showed higher resistance to fluconazole in *C.albicans* followed by *C.tropicalis*

Fluconazole resistance tested by PCR in *Candida albicans* showed the presence of ERG11 gene. Increasing rate of fluconazole resistance among *C.albicans* may be due to frequent use of these agents in the prophylaxis of fungal infections in immunocompromised patients. So, the best approach to the optimal management of fungal infection is early detection and identification of the causal agent, so that appropriate treatment can be initiated as soon as possible in immunocompromised patients.

Key words- Invasive fungal infections, Phospholipase & Hemolysin activity,

Fluconazole resistance, PCR, ERG11 gene.